DOCUMENT RESUME

ED 023 153 EA 001 575

By-Danowski, Charles E.

Two Reference Systems for School Quality Analysis.

Columbia Univ., New York. Inst. of Administrative Research.
Pub Date Feb 67
Note-6p.
Journal Cit-IAR-Research Bulletin; v7 n2 Feb 1967
EDRS Price MF-$0.25 HC-$0.40
Descriptors-*Educational Finance, *Educational Quality, *Expenditure Per Student, Instructional Staff, *Organizations (Groups), *School Systems, State Aid, Tax Rates, Teacher Salaries
Identifiers-APSS, Associated Public School Systems, Metropolitan School Study Council, MSSC

This paper compares key financial measures of the Metropolitan School Study Council (MSSC) with those of the Associated Public School Systems (APSS) to obtain data relative to school system quality. The objectives of the discussion are (1) to describe the 11 year trend from 1955-56 to 1965-66 for each group on measures of net current expenditure per pupil, average teacher salary, numerical staffing adequacy, equalized property valuation, state aid, and tax rates on equalized property valuation; (2) to indicate how the two groups differ on these measures; and (3) to examine the possibility of using the data on these organizations as references for school system quality analysis. To compare the financial measures, APSS means are plotted against MSSC percentiles. The MSSC schools outrank the APSS schools in all measures, and in most cases the MSSC schools are 10 years ahead of the APSS schools. The relationships between the mean scores have been constant over the period, giving rise to the possibility of formulating two specific sets of factors which could be employed for school system quality control. (HW)

ED 023153 EA 001 575

IAR Research Bulletin

INSTITUTE OF ADMINISTRATIVE RESEARCH
Teachers College • Columbia University

Volume 7, No. 2 February, 1967

Two Reference Systems for School Quality Analysis

Charles E. Danowski

Since their inception in the 1940's the Metropolitan School Study Council and the Associated Public School Systems have periodically surveyed certain of the key financial measures of their member school systems in order to obtain data relative to school system quality. Several benefits, involving analytical, comparative and predictive components, accrue to the contributing schools (each of which receives reports of its score and position on each measure). The school system also benefits from a knowledge of historical trends which, established after years of data-gathering, show the relative improvement, stability or decline of the school system on the factors studied.

Another advantage is now possible. Comparisons between the two organizations over an eleven year period show relationships between them which clearly point toward the development of two reference systems. The membership of the MSSC, a voluntary association of some 70 school systems in New York, New Jersey and Connecticut, includes school districts which, on the whole, are extremely well favored in factors of finance, public expectancy and staff compared to the schools of the country at large. The APSS, a similar organization of some 225 school systems in 42 states, represents a sampling of schools that are somewhat above the national average in terms of these characteristics. Each organization has now supplied sufficient data to permit an accurate determination of the trends in each, as well as to define the precise nature of the relationship between them.

The objectives of this discussion, then, are to: (1) describe the eleven year trend from 1955-56 to 1965-66 for each group of school districts on the measures of net current expenditure per pupil (NCE), average teachers' salary, numerical staffing adequacy (NSA), equalized property valuation, state aid and tax rates on equalized property valuation[1]; (2) indicate how the two groups of school districts differ on these measures; and (3) examine the possibility of using the data on these organizations as reference systems for school system quality analysis.

Three precautions are urged in the interpretation

[1] For definitions of these terms, see *Financing Council Schools, 1965-66* or *Financing APSS Schools, 1966*, New York, Institute of Administrative Research, Teachers College, Columbia University, 1966; also see *IAR Research Bulletin*, Vol. 1, No. 2, January, 1961.

FIGURE 1
ELEVEN YEARS OF NET CURRENT EXPENDITURE PER W.E.P.U.
APSS Means Plotted Against MSSC Percentiles

	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
High	$677.	$715.	$815.	$828.	$921.	$989.	$1,132.	$1,231.	$1,188.	$1,231.	$1,219.
75th Percentile	494.	510.	585.	626.	666.	722.	725.	798.	774.	881.	953.
50th Percentile	423.	432.	522.	550.	590.	619.	641.	717.	723.	733.	783.
25th Percentile	361.	358.	441.	481.	479.	515.	553.	598.	646.	606.	677.
Low	250.	225.	318.	314.	340.	358.	364.	378.	372.	377.	436.
APSS Mean	254.	*NA*	297.	*NA*	336.	*NA*	*NA*	406.	414.	447.	464.

of the following figures. First, although the figures are suitable indicators of trends, knowledge of the specific information about the unique aspects of a particular state or school is required to fully appreciate the import of the results. For example, within the Council itself 1965-66 state aid to local schools averaged $72 for New Jersey schools as compared to $310 for those in New York State. This difference is a prime indication of the financial variation caused solely by factors of state influence.

Second, the APSS is a voluntary organization and not, therefore, a stratified sample of the nation's schools. APSS schools do have in common a superintendent who is aware of the advantages of membership in a national research organization of schools. Similarly, the MSSC may not accurately represent all the schools in the metropolitan New York area, since only those possessing certain characteristics are eligible for membership.

Third, membership within each organization and participation in each study fluctuate slightly from year to year. Thus, small variations occur. Large fluctuations occurring at the extremes (highs and lows) of the ranges are not unusual. The average trends, however, as represented by the means, are relatively reliable.

Comparative Analysis of Two Groups of School Systems

The nature of this report may be summarized by an analysis of figures 1 through 4; each consists of a percentile scale for the interval from 1955-56 to 1965-66 based on data submitted by member schools of the MSSC. For each year the high, 75th percentile, 50th percentile, 25th percentile and low MSSC scores are specified on the vertical bars.

Mean APSS scores for each year for which data are available appear at the bottom of each figure. A point on the chart's bars locates the position of the APSS mean; a connecting line joins the means, thus providing a graphic view of the APSS trend. A horizontal line shows that the APSS mean has maintained its position relative to the Council's norming population; a decreasing line indicates a failure to keep pace; an ascending line demonstrates greater relative performance.

Factor 1—Net Current Expenditure. Of most importance according to previous studies of school system quality, net current expenditure per pupil is the amount currently being spent for instructional purposes other than debt service, capital outlay, tuition, transportation and reimbursed expenditures. Figure 1 shows that the mean MSSC net current expenditure has risen 85 per cent from $423 per pupil in 1956 to $783 per pupil in 1966. During the same period the mean APSS net current expenditure has risen, at a comparable rate, 83 per cent—from $254 per pupil to $464 per pupil.

Two important facts emerge from an analysis of Figure 1. First, both organizations are increasing their per pupil cost for education at a rate exceeding 6 per cent per year. Second, the relationship between the two organizations has remained virtually constant over the eleven year period. The ratio of the means of the two groups of schools is about the same, with MSSC about 65 per cent above APSS. The APSS mean NCE for each

FIGURE 2
ELEVEN YEARS OF AVERAGE TEACHERS' SALARIES
APSS Means Plotted Against MSSC Percentiles

	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
High	$7,150-	$7,480-	$7,911-	$8,264-	$8,550-	$9,050-	$9,425-	$10,267-	$10,650-	$11,035-	$11,244-
75th Percentile	5,738-	6,062-	6,764-	7,060-	7,199-	7,683-	8,077-	8,356-	8,575-	8,757-	9,040-
50th Percentile	5,250-	5,535-	6,129-	6,376-	6,643-	6,950-	7,200-	7,400-	7,640-	7,854-	8,067-
25th Percentile	4,867-	5,100-	5,567-	5,900-	6,125-	6,317-	6,583-	6,745-	7,000-	7,250-	7,400-
Low	4,183-	4,050-	4,065-	4,624-	5,102-	5,378-	5,300-	6,000-	5,750-	5,951-	6,400-
APSS Mean	3,990-	*NA*	4,617-	*NA*	5,047-	*NA*	*NA*	5,637-	5,905-	6,239-	6,436-

year can be located near the lowest NCE for a Council school. This location signifies that half the APSS schools spend as much per pupil for education as do several schools within the Council, and half spend less than any Council school system.

One may also discern a time lag between the two organizations. The mean NCE figures for the APSS in 1963 and 1964 are comparable to those of the MSSC in 1956 and 1957. Thus the Council appears to be about 7 years ahead of its sister organization in expenditure per pupil. However, because of the effects of continuing inflation in the economy, the APSS NCE of $447 in 1965 and $464 in 1966 more accurately reflect the buying power of the Council's expenditure levels for the years 1955 and 1956. Consequently, ten years is probably a more accurate estimate of the time lag between the MSSC and APSS with respect to net current expenditure per pupil calculated in constant dollars.

Factor 2—Average Teachers' Salaries. Schools must compete with other professions for trained personnel, and teachers' salary levels indicate the financial drawing power of the schools. Figure 2 shows that in the eleven year period MSSC schools have increased their average teachers' salary 54 per cent from $5250 to $8067 yearly. In the APSS, average annual teachers' salaries have risen 62 per cent from $3990 to $6436 over the same eleven year period.

A comparison of the APSS mean placement on the MSSC norming charts demonstrates the similarity of positioning between this economic factor of salary and the economic factor of expenditure. The APSS mean salary level again appears consistently at the lower extremity of the Council's salary range. Applying the time lag concept, there is a seven year financial differential (compare: APSS salary of $6239 in 1965 with MSSC salary of $6129 in 1958; APSS salary of $6436 in 1966 with MSSC salary of $6379 in 1959). And, when the corrections for inflation have been made, APSS lags ten years behind MSSC.

Factor 3—Numerical Staffing Adequacy.[2] One of the major determinants of school system quality, and one not directly affected by local or inflationary economic conditions, is the number of professionals employed by the school system. Figure 3 shows that over the past eleven years, MSSC schools have added to their staffs 8.2 professionals per thousand pupils. This 15 per cent increase (from 54.9 professionals per thousand pupils to 63.1) is comparable to the 15 per cent increase (from 43.5 to 49.9) for APSS schools.

Again, the comparison between the APSS and the MSSC data shows the same relationship. The APSS, in any given year, places near the low end of the MSSC scales. Applying the time lag concept to these figures, the trend shows the time differential in numerical staffing adequacy to exceed 20 years—twice as long as the financial lag.

Factor 4—State Aid. Second only to local monies derived from a property tax base, state aid is a major source of financial support for schools. A perusal of Figure 4 will show that over the nine-year period from

[2] For a more extensive treatment of the topic see "Teacher Preparation and Numerical Adequacy: An Historical Comparison," *IAR Research Bulletin*, Vol. 6, No. 3, June, 1966.

FIGURE 3
ELEVEN YEARS OF NUMERICAL ADEQUACY OF PROFESSIONAL STAFF
APSS Means Plotted Against MSSC Percentiles

	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
High	74.0	76.9	75.8	76.7	78.6	81.3	91.8	77.0	72.3	74.4	74.6
75th Percentile	58.7	59.2	61.2	63.9	62.2	63.7	64.9	65.0	64.0	65.4	67.1
50th Percentile	54.9	55.2	57.7	58.0	59.2	60.2	59.2	60.0	59.9	60.7	63.1
25th Percentile	51.7	51.2	53.5	55.1	53.7	53.8	54.9	55.0	56.4	56.8	56.2
Low	44.2	36.4	44.3	44.8	41.2	43.8	43.2	44.0	40.3	45.2	42.1
APSS Mean	43.5	*NA*	44.4	*NA*	46.1	*NA*	*NA*	48.0	48.4	49.2	49.9

1957-58 to 1965-66, state aid per pupil in MSSC schools has been increased by 82 per cent (from $122 to $222) while in APSS schools it has been increased by 35 per cent (from $133—above the Council average in 1956-57—to $179—lower than the Council average in 1965-66). Thus it appears that the superior state fiscal program in New York is in part responsible for the better fiscal performance of school districts in the Council.

Other Factors—Equalized Property Value and Tax Rates. One possible explanation for the time lag differentials of the previous factors is that the Council schools may have more property wealth behind each pupil and therefore can afford to spend more on education. In part, this contention is substantiated by information (not shown here) in the data bank of the Institute of Administrative Research. Recently, the equalized property valuation relationship between the APSS and MSSC schools has remained fairly constant—but this time, the APSS values have not been as low as in the other measures. The APSS mean has appeared consistently at the Council's 25th percentile. One can see here the well-known difficulty of obtaining a reliable interstate measure of property tax valuation. The equalized valuation figures are based on estimates gathered from assessed valuation. Assessment practices vary widely throughout each state and among states. Until precise, commensurate, systematic assessment procedures are adopted, all attempts at accurate measures of property values will be subject to these vagaries.

Despite the relative unreliability of "true" property value estimates, tax rates based on these estimates show a consistent relationship over the years between MSSC and APSS. In data bank figures (not shown here) APSS remains at about the 20th MSSC percentile.

Tape Stored Control Data on Individual School Systems

From this brief analysis, it should be clear that the relationships (of the sets of factors shown here) between these two voluntary associations of public schools have not altered substantially over the past decade. Indeed, the relationships between the mean scores on net current expenditure, average teachers' salaries, numerical staffing adequacy, state aid, equalized property value and tax rates have maintained remarkable constancy, giving rise to the possibility of formulating two specific sets of factors, each representative of one organization, which could be employed for school system quality control.

At least concerning the input factors analyzed here, there is evidence that the MSSC represents schools with superior financial inputs; there is also evidence that on these same input factors APSS is superior to the set of all the school systems in the country. Thus the MSSC and APSS can serve to establish two reference systems: one for those schools whose financial inputs are among

FIGURE 4
ELEVEN YEARS OF STATE AID PER W.E.P.U.
APSS Means Plotted Against MSSC Percentiles

	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66
High	$235-	$298-	$340-	$283-	$311-	$295-	$330-	$374-	$673-	$487-	$506-
75th Percentile	131-	153-	154-	183-	180-	190-	215-	240-	260-	265-	312-
50th Percentile	101-	121-	122-	138-	142-	159-	163-	183-	195-	190-	222-
25th Percentile	58-	57-	61-	78-	78-	59-	61-	63-	75-	76-	74-
Low	31-	9-	17-	18-	23-	26-	38-	40-	51-	51-	57-
APSS Mean	*NA*	*NA*	133-	*NA*	135-	*NA*	*NA*	168-	170-	177-	179-

the highest in the nation; another for those schools that are more nearly comparable to a selected national norming set of schools.

The purpose of any such sets of quantifiable measures is to yield an accurate and comprehensive model to facilitate school system decision-making. Supplementing the subjective descriptions which are available and providing a quantitative analysis of quality, studies now in progress within both the MSSC and APSS will provide each member district with the many advantages derived from developing and engaging in its own quality analysis. The insight and cooperation of member school systems of both organizations have provided for decades the vehicles through which the information required to establish the specific and salient elements of the two reference systems could be obtained.

By using tape and disc storage facilities of large modern computers, rapid and periodic acquisition, analysis and reporting of quality and quality-related factors can be provided, for the first time, on individual school systems. Accurate, up-to-date indicators of performance on financial, staff and organizational input factors, as influenced by local socio-economic conditions, public attitude and state programs of finance and control related to demonstrable measures of school quality will, it is conceivable, supply school administration with the kind of rapid quality control checks heretofore available almost exclusively to business and industry.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Research Bulletin

Devoted to research carried on by the Institute of Administrative Research and related groups, review of results, report of work in progress, discussion of theory and design, and implications for educational policies
Published in November, February and May
by the Institute of Administrative Research

William S. Vincent, *Director*
Charles E. Danowski, *Associate*
Charles M. Bernardo, *Associate*
Norman J. Walsh, *Associate*

Paul R. Mort Fellow
Robert L. Filbin

U.S. Office of Education Research Trainees
Ernst Auerbacher
Philip Brill
John J. [illegible]
Charles W. [illegible]
John K. Taylor

Research Fellows
John J. Battles
Albert C. Christensen
David L. Donovan
William H. Hall
Brian Simpson
Thomas P. Wilbur

Subscription rate: $1.50 per year
Copyright 1967: May be quoted without permission provided source is mentioned.
February, 1967

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY William S. Vincent

TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE U.S. OFFICE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."